



STIC Search Report

EIC 2100

STIC Database Tracking Number: 139101

TO: Susan F Rayyan
Location: RND 3C05
Art Unit : 2167
Wednesday, December 01, 2004

Case Serial Number: 10/038849

From: Carol Wong
Location: EIC 2100
RND - 4A30
Phone: 272-3513

carol.wong@uspto.gov

Search Notes

Dear Examiner Rayyan,

Attached are the search results (from commercial databases) for your case.

Color tags mark the patents/articles which appear to be most relevant to the case. Pls review all documents, since untagged items might also be of interest. If you wish to order the complete text of any document, pls submit request(s) directly to the EIC2100 Reference Staff located in RND-4B28.

Pls call if you have any questions or suggestions for additional terminology, or a different approach to searching the case. Finally, pls complete the attached Search Results Feedback Form, as the EIC/STIC is continually soliciting examiners' opinion of the search service.

Thanks,
Carol



STIC EIC 2100 139/01

Search Request Form

Today's Date:

12/1/04

What date would you like to use to limit the search?

Priority Date: 12/31/01 Other:

Name Susan Raygan

AU 2167 Examiner # 77889

Room # 3005 Phone 2417

Serial # 101038849

Format for Search Results (Circle One):

PAPER DISK EMAIL

Where have you searched so far?

USP DWPI EPO JPO ACM IBM TDB

IEEE INSPEC SPI Other _____

Is this a "Fast & Focused" Search Request? (Circle One) YES NO

A "Fast & Focused" Search is completed in 2-3 hours (maximum). The search must be on a very specific topic and meet certain criteria. The criteria are posted in EIC2100 and on the EIC2100 NPL Web Page at <http://ptoweb/patents/stic/stic-tc2100.htm>.

What is the topic, novelty, motivation, utility, or other specific details defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, definitions, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract, background, brief summary, pertinent claims and any citations of relevant art you have found.

Title: Optimizing an outer join using a bitmap index structure.

Inventor: Ramesh Bhashyam

Priority date: December 23, 2001

Assignee: N.C.R. Corp.

A method of performing outer joins of 2 tables. Each table associated with STARMAP1, STARMAP2. Each STARMAP includes bitmap entries.

IF bitmap entry set => see cl. 1 d1/d2

IF bit map entry in => see claim 1c

bit map array
index
outer join

join .key columns

STAR MAP is a bitmap index structure see Fig 4

Hash index

Bitmap indexing

STIC Searcher Carli Wong

Phone 272 3513

Date picked up 12-1

Date Completed 12/1/04



File 9:Business & Industry(R) Jul/1994-2004/Nov 30
 (c) 2004 The Gale Group
 File 13:BAMP 2004/Nov W2
 (c) 2004 The Gale Group
 File 16:Gale Group PROMT(R) 1990-2004/Dec 01
 (c) 2004 The Gale Group
 File 47:Gale Group Magazine DB(TM) 1959-2004/Dec 01
 (c) 2004 The Gale group
 File 148:Gale Group Trade & Industry DB 1976-2004/Nov 30
 (c)2004 The Gale Group
 File 160:Gale Group PROMT(R) 1972-1989
 (c) 1999 The Gale Group
 File 275:Gale Group Computer DB(TM) 1983-2004/Dec 01
 (c) 2004 The Gale Group
 File 570:Gale Group MARS(R) 1984-2004/Dec 01
 (c) 2004 The Gale Group
 File 621:Gale Group New Prod.Annou.(R) 1985-2004/Dec 01
 (c) 2004 The Gale Group
 File 636:Gale Group Newsletter DB(TM) 1987-2004/Dec 01
 (c) 2004 The Gale Group
 File 649:Gale Group Newswire ASAP(TM) 2004/Nov 22
 (c) 2004 The Gale Group

Set	Items	Description
S1	39883	BITMAP? OR (BIT OR STAR) () (MAP? ? OR MAPPED OR MAPPING?) OR STARMAP? OR RASTER(1W)IMAGE? ?
S2	718663	ARRAY? ?
S3	2764	S2(2N) (2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI) (1W) (D OR DIMENSION???? ?) OR CUBIC OR STEREOSCOPE? OR STEREO()SCOP??-???? ?)
S4	630	S2(2N) (VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENSION?)
S5	559	OUTERJOIN? OR OUTER() (JOIN OR JOINS OR JOINED OR JOINING?)
S6	1057533	INDEX? OR INDICIE? ? OR INDICE? ? OR SUBINDEX? OR SUBINDICIE? OR SUBINDICIE?
S7	53211	HASH?
S8	230	(NATURAL OR EQUI) ()JOIN? OR NATURALJOIN? OR EQUIJOIN?
S9	13890	JOIN?(5N) (COLUMN? OR TABLE? OR ROW? ?)
S10	43134	S1 OR S3:S4
S11	5	S5(S)S10
S12	51	S8:S9(S)S10
S13	56	S11:S12
S14	2	S13/2002:2004
S15	54	S13 NOT S14
S16	29	RD (unique items)

16/3,K/1 (Item 1 from file: 9)
 DIALOG(R)File 9:Business & Industry(R)
 (c) 2004 The Gale Group. All rts. reserv.

1803805 Supplier Number: 01803805 (USE FORMAT 7 OR 9 FOR FULLTEXT)
IBM's DB2 Tries For Universal Appeal
 (IBM's DB2 Universal Database has better parallel processing, graphical administrative tools, improved TCP/IP communications, and Java support)
 Information Week, p 88+
 April 21, 1997
 DOCUMENT TYPE: Journal ISSN: 8750-6874 (United States)
 LANGUAGE: English RECORD TYPE: Fulltext
 WORD COUNT: 1002

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:

...group for the same columns.

IBM has also enhanced its query-optimization tool, including dynamic **bit - map** technology to speed OLAP and decision-support functions, and Star **JOINS** -where several small dimension **tables** are **joined** to a large fact **table** .

Also new with version 5 is the Global SQL Cache, which maximizes sharing of SQL...

16/3,K/2 (Item 2 from file: 9)

DIALOG(R)File 9:Business & Industry(R)

(c) 2004 The Gale Group. All rts. reserv.

1288365 Supplier Number: 01288365 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Big Iron Gets C/S Links From Oracle

(Oracle introduced three software modules: Access Manager for AS/400,

Access Manager for IMS and Access Manager for CICS)

CommunicationsWeek, n 575, p 1+

September 18, 1995

DOCUMENT TYPE: Journal ISSN: 0748-8121 (United States)

LANGUAGE: English RECORD TYPE: Fulltext

WORD COUNT: 1188

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:

...Oracle database on multiprocessor servers. Oracle 7.3's new features include: adaptive parallel queries, **bit - mapped** index queries, histogramming of data distributions, parallel hash joins and star queries with support of unlimited **join tables** .

The adaptive parallel querying is one that is capable of dynamically shifting a parallel workload...

16/3,K/3 (Item 3 from file: 9)

DIALOG(R)File 9:Business & Industry(R)

(c) 2004 The Gale Group. All rts. reserv.

1220663 Supplier Number: 01220663 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Database World - Trinzic's RuleServer For 3-Tier Apps

(Trinzic introduced RuleServer, a second-generation client-server tool for

building three-tier applications)

Newsbytes News Network, p N/A

June 19, 1995

DOCUMENT TYPE: Journal (United States)

LANGUAGE: English RECORD TYPE: Fulltext

WORD COUNT: 672

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:

...crosstabs, and "automatic dictionary change propagation," or inheritance, he continued.

Other features will include buttons, **bitmaps**, list boxes and check boxes; "single query, heterogenous database **joins**," and a Query Governor with "row and time limits for IS (information systems) control."

During a demo at the press conference...

16/3,K/4 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

07052164 Supplier Number: 58370794 (USE FORMAT 7 FOR FULLTEXT)
The Unveiling Of Oracle8.(Product Information)
Craig, Robert
ENT, v11, n2, p48
July 16, 1997
Language: English Record Type: Fulltext Abstract
Document Type: Magazine/Journal; Professional
Word Count: 763

... interesting decision support enhancement is enhanced star schema support. Oracle7 is "star-aware" and supports **bitmap** indexes, but Oracle8 combines these concepts with parallel **bitmap** star joins. Parallel **bitmap** star joins, which is patent-pending technology, enable the query optimizer to locate records in a large number of dimensions and **join** them to a large fact **table** much faster than before. A demo query against a 1,700,000 row fact table...

16/3,K/5 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

06756481 Supplier Number: 56744596 (USE FORMAT 7 FOR FULLTEXT)
From Star to Snowflake to ERD.(Industry Trend or Event)
Spencer, Tricia; Loukas, Tom
Enterprise Systems Journal, v14, n10, p62
Oct, 1999
Language: English Record Type: Fulltext Abstract
Document Type: Magazine/Journal; Trade
Word Count: 2446

... were compared using two leading relational DBMSs. Tests were run using identical sets of queries, **joining** the fact **table** with varying numbers of dimensions. One DBMS, which supported the creation of **bitmap** indexes on the large dimension tables, generally performed better with the star schema, although in...

16/3,K/6 (Item 3 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

05135262 Supplier Number: 47838981 (USE FORMAT 7 FOR FULLTEXT)
The Unveiling Of Oracle
ENT, p048
July 16, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Professional
Word Count: 762

... interesting decision support enhancement is enhanced star schema support. Oracle7 is "star-aware" and supports **bitmap** indexes, but Oracle8 combines these concepts with parallel **bitmap** star joins. Parallel **bitmap** star joins, which is patent-pending technology, enables the query optimizer to locate records in a large number of dimensions and **join** them to a large fact **table** much faster than before. A demo query against a 1,700,000 row fact table...

16/3,K/7 (Item 4 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

05096609 Supplier Number: 47482739 (USE FORMAT 7 FOR FULLTEXT)
Tool, Upgrade Target Teradata Performance
Perez, Juan Carlos
PC Week, p028
June 23, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Tabloid; General Trade
Word Count: 222

... designed to better use system resources, officials said.
Other enhancements include the ability to create **bit - map** indexes on the fly to speed up query resolution and the addition of SQL-92 operations such as two-phase commit, **outer joins** and referential integrity, officials said.
Teradata 2.2 costs \$60,000 per node for up...

16/3,K/8 (Item 5 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

05051744 Supplier Number: 47415583 (USE FORMAT 7 FOR FULLTEXT)
ORACLE PREVIEWING RELEASE 8, SINGS ITS PRAISES AS FASTER, BIGGER, ALWAYS AVAILABLE DATAWAREHOUSE
Computergram International, n3168, pN/A
May 27, 1997
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 488

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...theoretical limit is 512 petabytes. Oracle has a patent pending on something it calls 'parallel **bitmap** star joins ', which puts the relationships between **tables** in a star schema into **bitmaps** to further speed queries. Add automatic failover, which enables queries to carry on where they...

16/3,K/9 (Item 6 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

04979190 Supplier Number: 47314822 (USE FORMAT 7 FOR FULLTEXT)
IBM's DB2 Tries For Universal Appeal
Fosdick, Howard

InformationWeek, p88
April 21, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Tabloid; General Trade
Word Count: 1020

... group for the same columns.

IBM has also enhanced its query-optimization tool, including dynamic **bit - map** technology to speed OLAP and decision-support functions, and Star **JOINS** --where several small dimension **tables** are **joined** to a large fact **table**.

Also new with version 5 is the Global SQL Cache, which maximizes sharing of SQL...

16/3,K/10 (Item 7 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

04355639 Supplier Number: 46387857 (USE FORMAT 7 FOR FULLTEXT)
MULTIMEDIA DATABASES: OBJECT VENDORS STEAL A MARCH WHILE RELATIONALS SQUABBLE - 2

Computergram International, n2913, pN/A
May 15, 1996
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 910

... internal and external sources).

Spoiling campaign

He wants a complete financial profile without having to **join up tables** manually in a relational structure," says Goldberg. Oracle's Version 8 is expected to support video and audio integration with full text search, parallel index construction, **bit - mapped** index technology and a front end with multi-dimensional data presentation. Object-orientation will be...

16/3,K/11 (Item 8 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

04104346 Supplier Number: 45984765 (USE FORMAT 7 FOR FULLTEXT)
Faster Data Warehouses: New tools provide high-performance querying through advanced indexing

InformationWeek, p77
Dec 4, 1995
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Tabloid; General Trade
Word Count: 2820

... a variety of compression techniques based on the index structures.

IQ's support of predefined **joins** significantly speeds up linking **tables**. Ad hoc **joins** also are supported, using the **row ids** identified in the **bitmaps**. The join algorithms are either a sort-merge, nested loop, or a modified hash join...

16/3,K/13 (Item 2 from file: 47)
DIALOG(R)File 47:Gale Group Magazine DB(TM)

(c) 2004 The Gale group. All rts. reserv.

04146978 SUPPLIER NUMBER: 16306552 (USE FORMAT 7 OR 9 FOR FULL TEXT)
RADical Development. (overview of eight evaluations of eight RAD tools)
(individual evaluation records searchable under "RADical Development")
(Software Review) (includes related articles on RAD tools, Editors'
Choice, choosing data paths, RAD suitability to task, test methodology
and development of RAD tools) (Evaluation)
Linthicum, David S.
PC Magazine, v13, n19, p153(8)
Nov 8, 1994
DOCUMENT TYPE: Evaluation ISSN: 0888-8507 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 3832 LINE COUNT: 00334

... of the more demanding portions of our test is the order-entry form,
which requires **joins** among four **tables**. It also performs lookups and
calculations in a master/detail configuration and displays a **bitmap**. We
required each vendor to use a Microsoft Visual Basic custom control in this
form...

16/3,K/14 (Item 3 from file: 47)
DIALOG(R)File 47:Gale Group Magazine DB(TM)
(c) 2004 The Gale group. All rts. reserv.

03962118 SUPPLIER NUMBER: 14457570 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Iconic Query. (IntelligenceWare Inc.) (Software Review) (one of seven
evaluations of nonprogrammable SQL access tools in 'SQL Access
Simplified') (Evaluation)
Plain, Stephen W.
PC Magazine, v12, n19, p307(3)
Nov 9, 1993
DOCUMENT TYPE: Evaluation ISSN: 0888-8507 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 810 LINE COUNT: 00064

... between various tables. This Application can be viewed in either
Normal mode, which displays the **tables** as icons with **join** lines
connecting them, or in Pictorial Query mode, which through a series of
simple **bitmapped** images guides the user visually. For example, an
application that uses data from various departments might use **bitmapped**
images of the actual office in each department. Smaller **bitmaps** can be
placed on-screen to trigger navigation to another section of the
application when...

16/3,K/15 (Item 4 from file: 47)
DIALOG(R)File 47:Gale Group Magazine DB(TM)
(c) 2004 The Gale group. All rts. reserv.

03629154 SUPPLIER NUMBER: 11443508 (USE FORMAT 7 OR 9 FOR FULL TEXT)
WindowBase: SQL made pretty, but slow. (Software Products International
Inc.'s WindowBase 1.0) (Software Review) (First Looks) (evaluation)
Shaw, Richard Hale
PC Magazine, v10, n20, p46(1)
Nov 26, 1991
DOCUMENT TYPE: evaluation ISSN: 0888-8507 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 905 LINE COUNT: 00070

... group headers, the report body, various totals, and a footer. You can also use SQL **Joins** to include information from multiple **tables** and insert **.PCX bit - mapped** graphics into a report.

One powerful but disturbing feature of WindowBase is dependent queries. These...

16/3,K/16 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

08306638 SUPPLIER NUMBER: 17781850 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Faster data warehouses: new tools provide high-performance querying through advanced indexing. (Technology Information)
Edelstein, Herb
InformationWeek, n556, p77(5)
Dec 4, 1995
ISSN: 8750-6874 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 3007 LINE COUNT: 00235

... linking tables. Ad hoc joins also are supported, using the row ids identified in the **bitmaps**. The join algorithms are either a sort-merge, nested loop, or a modified hash

16/3,K/17 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

08181495 SUPPLIER NUMBER: 17527103 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Big iron gets C/S links from Oracle. (database middleware) (includes related article on Version 7.3 of Oracle's relational DBMS) (Product Announcement)
Marshall, Martin
CommunicationsWeek, n575, p1(2)
Sep 18, 1995
DOCUMENT TYPE: Product Announcement ISSN: 0746-8121 LANGUAGE:
English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1265 LINE COUNT: 00104

... queries, histogramming of data distributions, parallel hash joins and star queries with support of unlimited **join tables**.

The adaptive parallel querying is one that is capable of dynamically shifting a parallel workload...

16/3,K/18 (Item 3 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

07205513 SUPPLIER NUMBER: 14927276 (USE FORMAT 7 OR 9 FOR FULL TEXT)
IHS, LEADING TECHNICAL INFORMATION PUBLISHER, UNITES INTERNAL AND EXTERNAL DATA
PR Newswire, p0321DV004R
March 21, 1994
LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 959 LINE COUNT: 00087

... and PC(R) platforms and windowing systems. IHS' new relational format enables users to perform **table joins** and other integration tasks

to link internal ORACLE databases with the IHS data. The IHS...

16/3,K/20 (Item 1 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2004 The Gale Group. All rts. reserv.

02192438 SUPPLIER NUMBER: 20049363 (USE FORMAT 7 OR 9 FOR FULL TEXT)
A DBA's view of DB2. (IBM's DB2 Universal Server 5.0 DBMS) (Server Side)
(Software Review) (Evaluation) (Column)
Rennhackkamp, Martin
DBMS, v10, n13, p71(4)
Dec, 1997
DOCUMENT TYPE: Evaluation Column ISSN: 1041-5173 LANGUAGE:
English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 3494 LINE COUNT: 00282

... including star joins, cubes, roll-up, parallel querying, a cost-based optimizer, query rewriting, and **bitmap** indexes. DB2 uses **bitmap** indexes when processing warehouse-type queries. It builds the **bitmap** indexes dynamically during query processing and uses them during query execution. It applies a similar technique when processing star joins from large fact tables.

There are new extensions to the GROUP BY clause of the SQL SELECT statement for...

16/3,K/21 (Item 2 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2004 The Gale Group. All rts. reserv.

01952184 SUPPLIER NUMBER: 18429287
Accelerating indexed searching. (Technology Information)
Bontempo, Charles J.; Saracco, C.M.
Database Programming & Design, v9, n7, p36(7)
July, 1996
ISSN: 0895-4518 LANGUAGE: English RECORD TYPE: Abstract

...ABSTRACT: support B+ tree indexes, and some have enhanced their indexes with AND and OR processing. **Bitmap** indexes have come back into use, and vendors of data warehouse and OLAP systems have started using this technology to support complex queries. A **bitmap** index uses a single bit to indicate that a value of an attribute is associated with an entity. Another challenge is maintaining performance for a multitable **join** of large tables. **Join** processing can be optimized with the help of join indexes, which are a type of precomputed join in which the index contains references to the rows in the tables that satisfy each join condition.

16/3,K/22 (Item 3 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2004 The Gale Group. All rts. reserv.

01833060 SUPPLIER NUMBER: 17296091 (USE FORMAT 7 OR 9 FOR FULL TEXT)
The truth about OLAP. (online analytical processing) (includes a related article on relational databases and multidimensional modeling, and a table on OLAP products) (Cover Story)
Frank, Maurice
DBMS, v8, n9, p40(6)
August, 1995

DOCUMENT TYPE: Cover Story ISSN: 1041-5173 LANGUAGE: English
RECORD TYPE: Fulltext; Abstract
WORD COUNT: 4453 LINE COUNT: 00390

... designs, indexing techniques also serve to accelerate query performance. Red Brick's variation on prejoined **tables** moves the **join** into indexes by combining both the parent table's foreign-key column and the child table's primary key into one compound index expression. **Bitmapped** index approaches have also become popular adjuncts to query optimization. While conventional wisdom states that...

16/3,K/23 (Item 4 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2004 The Gale Group. All rts. reserv.

01688541 SUPPLIER NUMBER: 15356010 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Microcomputer DBMSs and application development systems. (1994 Database Buyer's Guide and Client/Server Sourcebook) (Buyers Guide)
DBMS, v7, n6, p42(5)
June 15, 1994
DOCUMENT TYPE: Buyers Guide ISSN: 1041-5173 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 6920 LINE COUNT: 00585

... 95 machine code and bitmap index optimization enable PDQ to resolve complex queries involving huge **tables**, multiway **joins**, and aggregation quickly. ODBC Level 1 compliance lets the product be used with any ODBC...

16/3,K/25 (Item 6 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2004 The Gale Group. All rts. reserv.

01606058 SUPPLIER NUMBER: 13998643 (USE FORMAT 7 OR 9 FOR FULL TEXT)
ObjectView version 2.0. (KnowledgeWare Inc.'s database front-end application development software) (Software Review) (Hands On) (Evaluation)
Frank, Maurice
DBMS, v6, n8, p24(2)
July, 1993
DOCUMENT TYPE: Evaluation ISSN: 1041-5173 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1489 LINE COUNT: 00116

...ABSTRACT: is a Logical Data Modeler (LDM) that allows multiple fields to be dragged from database **tables**, then dropped and **joined** to create panel objects on forms. The forms editor automatically generates Connect buttons, offers a toolbar for creating drop-down lists and push buttons and allows users to paste **bitmap** and Meta-File graphics from the clipboard. ObjectView does not support Object Linking and Embedding...

16/3,K/26 (Item 7 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2004 The Gale Group. All rts. reserv.

01551297 SUPPLIER NUMBER: 13078341 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Access arrives. (Microsoft Corp.'s Access database management system) (News) (Brief Article) (Product Announcement)

EXE, v7, n7, p4(1)

Dec, 1992

DOCUMENT TYPE: Product Announcement ISSN: 0268-6872 LANGUAGE:

ENGLISH RECORD TYPE: FULLTEXT

WORD COUNT: 336 LINE COUNT: 00026

TEXT:

...It also provides a graphical version of QBE which enables users to drag and drop **tables**, **join** fields and select criteria with a mouse. Access can operate as an OLE client, giving users the ability to edit documents, **bitmaps** or sound embedded in a database. An interactive report generator, forms designer and graph tool...

16/3,K/27 (Item 1 from file: 636)

DIALOG(R)File 636:Gale Group Newsletter DB(TM)

(c) 2004 The Gale Group. All rts. reserv.

03184810 Supplier Number: 46522665 (USE FORMAT 7 FOR FULLTEXT)

SAS INSTITUTE: SAS Institute enters the world of parallelism with its Scalable Performance Data Server

M2 Presswire, pN/A

July 4, 1996

Language: English Record Type: Fulltext

Document Type: Newswire; Trade

Word Count: 514

... that access large volumes of data. The SPDS will offer alternative indexing strategies, such as **bit - mapped** indexing to help improve the speed of record retrieval. The SPDS will also provide improved sort throughput by offering parallel sorting and improved **joining** performance by allowing parallel **table** scans. With the SPDS, SAS users on 32-bit UNIX file systems will not be...

16/3,K/28 (Item 2 from file: 636)

DIALOG(R)File 636:Gale Group Newsletter DB(TM)

(c) 2004 The Gale Group. All rts. reserv.

02767924 Supplier Number: 45617183 (USE FORMAT 7 FOR FULLTEXT)

Database World - Trinzic's RuleServer For 3-Tier Apps 06/19/95

Newsbytes, pN/A

June 19, 1995

Language: English Record Type: Fulltext

Document Type: Newswire; General Trade

Word Count: 678

... crosstabs, and "automatic dictionary change propagation," or inheritance, he continued.

Other features will include buttons, **bitmaps**, list boxes and check boxes; "single query, heterogenous database **joins**," and a Query Governor with "row and time limits for IS (information systems) control."

During a demo at the press conference...

16/3,K/29 (Item 3 from file: 636)

DIALOG(R)File 636:Gale Group Newsletter DB(TM)

(c) 2004 The Gale Group. All rts. reserv.

02392279 Supplier Number: 44727309 (USE FORMAT 7 FOR FULLTEXT)

LEADING TECHNICAL INFORMATION PUBLISHER UNITES INTERNAL AND EXTERNAL DATA

Worldwide Videotex Update, v13, n6, pN/A

June, 1994

Language: English Record Type: Fulltext

Document Type: Newsletter; Trade

Word Count: 841

... with IHS-developed SQL-based data access tools. This index information will be tied to **raster images** of the data on CD-ROM discs via "hyperlinks." Users can access the IHS data...

...and other platforms and windowing systems. IHS's new relational format enables users to perform **table joins** and other integration tasks to link internal ORACLE databases with the IHS data. The IHS...

?

Set	Items	Description
S1	39883	BITMAP? OR (BIT OR STAR)() (MAP? ? OR MAPPED OR MAPPING?) OR STARMAP? OR RASTER(1W)IMAGE? ?
S2	718663	ARRAY? ?
S3	2764	S2(2N) (2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI) (1W) (D OR DIMENSION???? ?) OR CUBIC OR STEREO SCOP? OR STEREO() SCOP??-???? ?)
S4	630	S2(2N) (VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENSION?)
S5	559	OUTERJOIN? OR OUTER() (JOIN OR JOINS OR JOINED OR JOINING?)
S6	1057533	INDEX? OR INDICIE? ? OR INDICE? ? OR SUBINDEX? OR SUBINDICIE? OR SUBINDICIE?
S7	53211	HASH?
S8	230	(NATURAL OR EQUI)() JOIN? OR NATURALJOIN? OR EQUIJOIN?
S9	13890	JOIN?(5N) (COLUMN? OR TABLE? OR ROW? ?)
S10	43134	S1 OR S3:S4
S11	5	S5(S)S10
S12	51	S8:S9(S)S10
S13	56	S11:S12
S14	2	S13/2002:2004
S15	54	S13 NOT S14
S16	29	RD (unique items)
S17	0	AU='RAMESH B'
S18	0	AU=RAMESH B?
S19	4	AU=RAMESH, B?
S20	0	AU=BHASHYAM R?
S21	0	AU=BHASHYAM, R?
S22	0	S19 AND S10
S23	4	RD S19 (unique items)
S24	4	S23 NOT S13

? t24/k/all

24/K/1 (Item 1 from file: 275)
DIALOG(R)File 275:(c) 2004 The Gale Group. All rts. reserv.

... Ramesh, Balasubramaniam

24/K/2 (Item 2 from file: 275)
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... Ramesh, Balasubramaniam

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Ramesh, Balasubramaniam ...

?

File 696:DIALOG Telecom. Newsletters 1995-2004/Nov 30
(c) 2004 The Dialog Corp.
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(c) 2004 ProQuest Info&Learning
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(c) 2004 The HW Wilson Co.
File 112:UBM Industry News 1998-2004/Jan 27
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(c) 2004 ProQuest
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File 613:PR Newswire 1999-2004/Nov 25
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File 647:CMP Computer Fulltext 1988-2004/Nov W3
(c) 2004 CMP Media, LLC
File 674:Computer News Fulltext 1989-2004/Sep W1
(c) 2004 IDG Communications

Set	Items	Description
S1	12489	BITMAP? OR (BIT OR STAR) () (MAP? ? OR MAPPED OR MAPPING?) OR STARMAP? OR RASTER(1W)IMAGE? ?
S2	526641	ARRAY? ?
S3	1369	S2(2N) (2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI) (1W) (D OR DIMENSION???? ?) OR CUBIC OR STEREO SCOP? OR STEREO() SCOP??-???? ?)
S4	231	S2(2N) (VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENSION?)
S5	148	OUTERJOIN? OR OUTER() (JOIN OR JOINS OR JOINED OR JOINING?)
S6	1678196	INDEX? OR INDICIE? ? OR INDICE? ? OR SUBINDEX? OR SUBINDICIE? OR SUBINDICIE?
S7	111582	HASH?
S8	151	(NATURAL OR EQUI) () JOIN? OR NATURALJOIN? OR EQUIJOIN?
S9	15826	JOIN? (5N) (COLUMN? OR TABLE? OR ROW? ?)
S10	14051	S1 OR S3:S4
S11	1	S5(S)S10
S12	13	S8:S9(S)S10
S13	14	S11:S12
S14	2	S13/2002:2004

S15	14	S13 NOT 14
S16	11	RD (unique items)
S17	0	AU=RAMESH B?
S18	14	AU=RAMESH, B?
S19	0	AU=BHASHYAM R?
S20	0	AU=BHASHYAM, R?
S21	0	S18 AND S10
S22	12	RD S18 (unique items)

16/3,K/1 (Item 1 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)
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02779818 575952461

Cascade Graphs: Design, Analysis and Algorithms for Relational Joins

Gopal, Ram D; Ramesh, R; Zionts, Stanley
INFORMS Journal on Computing v13n1 PP: 2-28 Winter 2001
ISSN: 1091-9856 JRNL CODE: INJC
WORD COUNT: 12874

...TEXT: to spatial and temporal applications is hampered by the hashing strategy, which is designed for **equi - joins**. Query processing in these environments involves neighborhood operations over spatial or temporal dimensions that necessitate processing non **equi - joins** (Ahn and Snodgrass 1988, Orenstein 1990, Ozsoyoglu and Snodgrass 1995, Patel and DeWitt 1996). However...

... Chauduri and Dayal 1997). Star-join algorithms based on join indices (Valduriez 1986, 1987), and **bit mapped** indices or bit sliced indices (O'Neil and Graefe 1995, O'Neil and Quass 1997...on Knowledge and Data Engineering 5 322-338.

O'Neil, P., G. Graefe. 1995. Multi-**table joins** through **bitmapped join** indices. SIGMOD Record 21 173-182.
O'Neil, P., D. Quass. 1997. Improved query performance...

16/3,K/3 (Item 3 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)
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01696272 03-47262

The IBM data warehouse architecture

Bontempo, Charles; Zagelow, George
Communications of the ACM v41n9 PP: 38-48 Sep 1998
ISSN: 0001-0782 JRNL CODE: ACM
WORD COUNT: 3419

...TEXT: selection during database design UDB dynamic bitmaps are also used to process star queries requiring **joins** of dimensions and large fact **tables**.

Database Middleware

An MDBS can be deployed to supplement the DBMS supporting warehouse processing in...

16/3,K/4 (Item 4 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)
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01418858 00-69845

IBM's DB2 tries for universal appeal

Fosdick, Howard
Informationweek n627 PP: 88-90 Apr 21, 1997
ISSN: 8750-6874 JRNL CODE: IWK
WORD COUNT: 986

...TEXT: ROLLUP group for the same columns.

IBM has also enhanced its query optimization tool, including dynamic **bit - map** technology to speed OLAP and decision-support functions, and Star **JOINS** -where several small dimension **tables** are **joined** to a large fact **table** .

Also new with version 5 is the Global SQL Cache, which maximizes sharing of SQL...

16/3,K/5 (Item 1 from file: 813)
DIALOG(R)File 813:PR Newswire
(c) 1999 PR Newswire Association Inc. All rts. reserv.

0861210 LA025
ORACLE7 RELEASE 7.3 EXTENDS ORACLE'S LEAD IN DATA WAREHOUSING MARKET

DATE: September 19, 1995 11:01 EDT WORD COUNT: 1,249

...Now, new features in 7.3
extend Oracle's ability to harness increased hardware power.
Bit - Mapped Index Queries: **Bit - mapped** indexing is a technique that delivers dramatic speed improvements in processing certain types of queries...

...in a column
are very small, such as the choice of "red," "blue" or "green." **Bit - mapped** index queries, which were previously supported through the separate Oracle TextServer product, will be integrated...

...7.2. Release 7.3 can now apply the algorithm to an unlimited number of **join tables** , delivering tremendous performance advantages over traditional methods of **joining tables** . This also eliminates the appeal of costly, special-purpose external query processors available from niche...

16/3,K/6 (Item 2 from file: 813)
DIALOG(R)File 813:PR Newswire
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0686715 DV004R
IHS, LEADING TECHNICAL INFORMATION PUBLISHER, UNITES INTERNAL AND EXTERNAL DATA

DATE: March 21, 1994 11:43 EST WORD COUNT: 872

...with IHS-developed SQL-based data access tools. This index information will be tied to **raster images** of the data on CD-ROM discs via "hyperlinks." Users can access the IHS data...

...and PC(R) platforms and windowing systems. IHS' new relational format enables users to perform **table joins** and other integration tasks to link internal ORACLE databases with the IHS data. The IHS...

16/3,K/7 (Item 1 from file: 20)

DIALOG(R)File 20:Dialog Global Reporter
(c) 2004 The Dialog Corp. All rts. reserv.

14706514 (USE FORMAT 7 OR 9 FOR FULLTEXT)

NEWS: Oracle integrates business intelligence software into 9i
ASIA COMPUTER WEEKLY

December 25, 2000

JOURNAL CODE: FACW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 599

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... dimensional databases, said Mirani.

These features include bitmap join indexes, enhancements to materialised views, full **outer joins**, "With" clause, adaptive direct I/O operation, and automatic memory tuning.

Typically, software vendors offer...

16/3,K/8 (Item 1 from file: 647)

DIALOG(R)File 647:CMP Computer Fulltext
(c) 2004 CMP Media, LLC. All rts. reserv.

01123549 CMP ACCESSION NUMBER: IWK19970421S0053

IBM's DB2 Tries For Universal Appeal - New cross-platform release adds the missing links

Howard Fosdick

INFORMATIONWEEK, 1997, n 627, PG88

PUBLICATION DATE: 970421

JOURNAL CODE: IWK LANGUAGE: English

RECORD TYPE: Fulltext

SECTION HEADING: Software

WORD COUNT: 1009

... group for the same columns.

IBM has also enhanced its query-optimization tool, including dynamic **bit - map** technology to speed OLAP and decision-support functions, and Star **JOINS** -where several small dimension **tables** are **joined** to a large fact **table**.

Also new with version 5 is the Global SQL Cache, which maximizes sharing of SQL...

16/3,K/9 (Item 2 from file: 647)

DIALOG(R)File 647:CMP Computer Fulltext
(c) 2004 CMP Media, LLC. All rts. reserv.

01073909 CMP ACCESSION NUMBER: IWK19951204S0045

Technology Analysis - Faster Data Warehouses - New tools provide high-performance querying through advanced indexing (In Short)

Herb Edelstein

INFORMATIONWEEK, 1995, n 556, PG77

PUBLICATION DATE: 951204

JOURNAL CODE: IWK LANGUAGE: English

RECORD TYPE: Fulltext

SECTION HEADING: OpenLabs

WORD COUNT: 2837

... a variety of compression techniques based on the index structures.
IQ's support of predefined **joins** significantly speeds up linking

tables . Ad hoc **joins** also are supported, using the **row** ids identified in the **bitmaps** . The join algorithms are either a sort-merge, nested loop, or a modified hash join...

16/3,K/10 (Item 3 from file: 647)
DIALOG(R)File 647:CMP Computer Fulltext
(c) 2004 CMP Media, LLC. All rts. reserv.

01065137 CMP ACCESSION NUMBER: CWK19950918S0105
Oracle to Divulge RDBMS Details (In Brief)
Martin Marshall
COMMUNICATIONSWEEK, 1995, n 575, PG102
PUBLICATION DATE: 950918
JOURNAL CODE: CWK LANGUAGE: English
RECORD TYPE: Fulltext
SECTION HEADING: Top of the News
WORD COUNT: 346

... Oracle database on multiprocessor servers. Oracle 7.3's new features include: adaptive parallel queries, **bit - mapped** index queries, histogramming of data distributions, parallel hash joins and star queries with support of unlimited **join tables** .

The adaptive parallel querying is one that is capable of dynamically shifting a parallel workload...

16/3,K/11 (Item 1 from file: 674)
DIALOG(R)File 674:Computer News Fulltext
(c) 2004 IDG Communications. All rts. reserv.

047296
Beta Notes apps show real promise
Byline: Lee Schlessinger
Journal: Network World Page Number: 1
Publication Date: October 09, 1995
Word Count: 686 Line Count: 62

Text:

... and intuitive. Notes Reporter looks at Notes databases as if they were true relational database **tables** . It it can perform relational **joins** across multiple **tables** . Users do not have to know too many relational database concepts, though, because the Report...

... Image Viewer specifically addresses viewing of incoming faxes. Formats supported by LN:DI include TIFF, **bitmap** , Photo CD, PCX, JPEG and GIF. One product we did not get to play with...

?

? t22/k/all

22/K/1 (Item 1 from file: 15)
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Ramesh, Balasubramaniam ...

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Ramesh, Balasubramaniam

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22/K/7 (Item 1 from file: 98)
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Hillarp, Andreas; Ramesh, Bala

22/K/8 (Item 2 from file: 98)
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Ramesh, B. R

22/K/9 (Item 1 from file: 484)
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... Ramesh, Balasubramaniam

22/K/12 (Item 4 from file: 484)
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Ramesh, Balasubramaniam ...
? t22/k/8

22/K/8 (Item 2 from file: 98)
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Ramesh, B. R
? t22/6/8

22/6/8 (Item 2 from file: 98)
03758785 H.W. WILSON RECORD NUMBER: BGS198008785
A vegetation based approach to biodiversity gap analysis in the
Agastyamalai region, Western Ghats, India.
Dec. '97 (19971200)
?

File 6:NTIS 1964-2004/Nov W3
(c) 2004 NTIS, Intl Cpyrght All Rights Res

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(c) 2004 Institution of Electrical Engineers

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Set	Items	Description
S1	8308	BITMAP? OR (BIT OR STAR)() (MAP? ? OR MAPPED OR MAPPING?) OR STARMAP? OR RASTER(1W)IMAGE? ?
S2	681821	ARRAY? ?
S3	27520	S2(2N) (2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI) (1W) (D OR DIMENSION???? ?) OR CUBIC OR STEREOSCOP? OR STEREO()SCOP??-???? ?)
S4	2203	S2(2N) (VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENSION?)
S5	152	OUTERJOIN? OR OUTER() (JOIN OR JOINS OR JOINED OR JOINING?)
S6	1379931	INDEX? OR INDICIE? ? OR INDICE? ? OR SUBINDEX? OR SUBINDIC-E? OR SUBINDICIE?
S7	30607	HASH?
S8	705	(NATURAL OR EQUI)()JOIN? OR NATURALJOIN? OR EQUIJOIN?
S9	7378	JOIN?(5N) (COLUMN? OR TABLE? OR ROW? ?)
S10	37728	S1 OR S3:S4
S11	1	S5 AND S10
S12	7	S8:S9 AND S10
S13	8	S11:S12
S14	1	S13/2002:2004

S15	7	S13 NOT S14
S16	6	RD (unique items)
S17	756	AU=RAMESH B?
S18	151	AU=RAMESH, B?
S19	6	AU=BHASHYAM R?
S20	5	AU=BHASHYAM, R?
S21	0	S17:S20 AND S10
S22	3	S17:S20 AND S5
S23	0	S17:S20 AND S8:S9
S24	3	S22 NOT S13
S25	1	RD (unique items)

16/7/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.

5856756 INSPEC Abstract Number: C9804-6160D-006

Title: Array-based evaluation of multi-dimensional queries in object-relational database systems

Author(s): Zhao, Y.; Ramasamy, K.; Tufte, K.; Naughton, J.F.

Author Affiliation: Wisconsin Univ., Madison, WI, USA

Conference Title: Proceedings. 14th International Conference on Data Engineering (Cat. No.98CB36164) p.241-9

Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA

Publication Date: 1998 Country of Publication: USA xxi+605 pp.

ISBN: 0 8186 8289 2 Material Identity Number: XX98-00410

U.S. Copyright Clearance Center Code: 0 8186 8289 2/98/\$10.00

Conference Title: Proceedings 14th International Conference on Data Engineering

Conference Sponsor: IEEE Comput. Soc. Tech. Committee on Data Eng

Conference Date: 23-27 Feb. 1998 Conference Location: Orlando, FL, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P)

Abstract: Since multi - dimensional arrays are a natural data structure for supporting multi-dimensional queries, and object-relational (O/R) database systems support multi - dimensional array ADTs (abstract data types), it is natural to ask if a multi - dimensional array -based ADT can be used to improve O/R DBMS performance on multi-dimensional queries. As an initial step toward answering this question, we have implemented a multi - dimensional array in the Paradise O/R DBMS. In this paper, we describe the implementation of this compressed-array ADT and explore its performance for queries including star-join consolidations and selections. We show that, in many cases, the array ADT can provide significantly higher performance than can be obtained by applying techniques such as bitmap indices and star-join algorithms to relational tables. (16 Refs)

Subfile: C

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16/7/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC
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5066298 INSPEC Abstract Number: C9511-6160-006

Title: Multi- table joins through bitmapped join indices

Author(s): O'Neil, P.; Graefe, G.

Author Affiliation: Microsoft Corp., Redmond, WA, USA

Journal: SIGMOD Record vol.24, no.3 p.8-11

Publication Date: Sept. 1995 Country of Publication: USA

CODEN: SRECD8 ISSN: 0163-5808

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: The paper shows how to combine some well-known techniques to create a method that efficiently executes common multi- table joins. We concentrate on a commonly occurring type of join known as a star-join, although the method presented generalizes to any type of multi- table join. A star-join consists of a central detail table with large cardinality, such as an orders table (where an order row contains a single purchase) with foreign keys that join to descriptive tables, such as customers, products, and (sales) agents. The method uses join indices with compressed bitmap representations, which allow predicates restricting

columns of descriptive tables to determine an answer set (or found set) in the central detail table; the method uses different predicates on different descriptive tables in combination to restrict the detail **table** through compressed **bitmap** representations of join indices, and easily completes the join of the fully restricted detail **table** rows back to the descriptive tables. We outline realistic examples where the combination of these techniques yields substantial performance improvements over alternative, more traditional query evaluation plans. (4 Refs)

Subfile: C

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16/7/3 (Item 1 from file: 256)
DIALOG(R)File 256:TecInfoSource
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00144471 DOCUMENT TYPE: Review

PRODUCT NAMES: Cache 5.0 (026948)

TITLE: InterSystems Cache 5.0
AUTHOR: de Bruijn, Michiel
SOURCE: new.architect, v7 n12 p46(2) Dec 2002
HOMEPAGE: <http://www.newarchitectmag.com>

RECORD TYPE: Review
REVIEW TYPE: Review
GRADE: B

InterSystems' Cache 5.0, a 'post-relational' database, gets very good marks, especially for its abilities to blend an object-oriented approach transparently with relational views and to maintain compatibility with installed implementations using methods that require no additional coding. However, Cache 5.0 is not a highly publicized product, which could hinder deployment in more conservative technical environments. In addition, testers ran into some glitches during evaluation. Cache is a database with a difference: it keeps data in **multidimensional arrays**, to which the system has OO access. This is a significant perk for programmers, who instead of having to mold complex data structures into flat tables and **rows** with such constructs as SQL **JOINS** and stored procedures, can store and retrieve classes directly into their native format. Cache can be used with installed database tools, such as report generators, because transparent access is provided to multidimensional data using a relational view and standard ODBC and JDBC drivers. Cache ships with Cache Studio IDE (for straightforward design, testing, and documentation of databases), in addition to its own Web access engine for serving Cache Server Pages and tools needed to create XML/Simple Object Access Protocol (SOAP) Web services. Cache's functions and features are described in some detail, including its design as a full-functioned database rather than an add-on, which makes it a stable and well-performing database.

REVISION DATE: 20030430

16/7/5 (Item 1 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online
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01657231 ORDER NO: AAD98-36829
PERFORMANCE ISSUES OF MULTI-DIMENSIONAL DATA ANALYSIS (CUBING, ON LINE

ANALYTICAL PROCESSING)

Author: ZHAO, YIHONG

Degree: PH.D.

Year: 1998

Corporate Source/Institution: THE UNIVERSITY OF WISCONSIN - MADISON (0262)

Supervisor: JEFFREY NAUGHTON

Source: VOLUME 59/07-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 3563. 125 PAGES

This thesis investigates performance issues that arise in multi-dimensional analysis. It tries to solve three closely related problems in multi-dimensional data analysis by designing high performance storage structures and algorithms. Recently, On-Line Analytical Processing (OLAP) has become the most widely used and that in many cases the array ADT can provide significantly higher performance than can be obtained by applying traditional techniques such as **bitmap** indices and star-join algorithms to relational **tables**.

In the second part of the thesis, we designed and implemented array-based algorithms for cubing, which is one of the core operations of OLAP. Cubing computes group-by aggregations over all possible subsets of the specified dimensions. Our position-based algorithms adopt a dramatically different approach for computing multiple aggregated than the traditional value-based aggregation methods due to the fundamental difference of data storage. We have developed the array-based cubing algorithms. They compute a cube from data residing on the Unix file system. The performance study shows that the array-based cubing algorithms are significantly faster than the leading relational counterparts.

In the third part of the thesis, we study the issues of optimization and evaluation for multiple related OLAP queries. This problem has become increasingly important since Microsoft proposed its "OLE DB for OLAP" standard. OLE DB for OLAP defines Multi-Dimensional Expressions (MDX), which have the interesting and challenging feature of allowing clients to ask several related dimensional queries in a single MDX expression. To solve the problem, we developed two algorithms to generate a good global plan by using a proper set of precomputed aggregates. Furthermore, we designed and implemented a set of new query primitives for the multiple queries sharing portions of their evaluation. We have developed the algorithms and three new query operators in the same version of Paradise DBMS as the first part of the thesis. We have run our performance tests on the Paradise.

?

? t25/7

25/7/1 (Item 1 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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13173115 Genuine Article#: BAV33 Number of References: 23

Title: Outer join elimination in the teradata RDBMS

Author(s): Ghazal A (REPRINT) ; Crolotte A; Bhashyam R

Corporate Source: NCR Corp, Teradata Div, 100 N Sepulveda Blvd/El

Segundo//CA/90245 (REPRINT); NCR Corp, Teradata Div, El Segundo//CA/90245
(ahmad.ghazal@ncr.com; alain.crolotte@ncr.com; ramesh.bhashyam@ncr.com)

, 2004, V3180, P730-740

ISSN: 0302-9743 Publication date: 20040000

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GERMANY

Series: LECTURE NOTES IN COMPUTER SCIENCE

Language: English **Document Type:** ARTICLE

Abstract: Queries in relational DBMS are getting more and more complex especially in the decision support environment. Also, tools generate most SQL queries received by commercial DBMS engines with not much user control. Query rewrite plays an important role in optimizing these complex and tool-generated queries. One important such technique is eliminating redundant joins whenever possible. In this paper, we present a new solution for **outer join** elimination. This solution was implemented in the Teradata DBMS part of V2R5.1. As an example, we show how applications based on vertical partitioning and universal views can greatly benefit from our **outer join** elimination technique. Finally, we describe performance improvement results of applying these techniques to the TPC-H benchmark.

10/038,849

(FILE 'HOME' ENTERED AT 14:15:37 ON 01 DEC 2004)

FILE 'COMPUAB, COMPUSCIENCE, CONFSCI, CONF, ELCOM, INFODATA, RUSSCI, SIGLE, RDISCLOSURE, ANTE, LISA' ENTERED AT 14:18:15 ON 01 DEC 2004

L1 1097 SEA BITMAP? OR (BIT OR STAR) (W) MAP? OR STARMAP? OR RASTER(1W)
IMAGE#
L2 40317 SEA ARRAY#
L3 1657 SEA L2(2N) (2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI) (1W) (D
OR DIMENSION?) OR CUBIC OR STEREOSCOP? OR STEREO(W) SCOP?)
L4 243 SEA L2(2N) (VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENS
ION?)
L5 43 SEA OUTERJOIN? OR OUTER(W) JOIN?
L6 71948 SEA INDEX? OR INDICIE? OR INDICE? OR SUBINDEX? OR SUBINDICE?
OR SUBINDICIE?
L7 2608 SEA HASH?
L8 115 SEA (NATURAL OR EQUI) (W) JOIN? OR NATURALJOIN? OR EQUIJOIN?
L9 193 SEA JOIN? (5N) (COLUMN? OR TABLE? OR ROW#)
L10 2972 SEA L1 OR (L3 OR L4)
L11 0 SEA L5 AND L10
L12 2 SEA (L8 OR L9) AND L10
L13 186575 SEA 2002-2004/PY
L14 2 SEA L12 NOT L13

=> d bib abs l14 1-2

L14 ANSWER 1 OF 2 COMPUAB COPYRIGHT 2004 CSA on STN
AN 1998:9125 COMPUAB
TI Array-based evaluation of multi-dimensional queries in object-relational
database systems
PROC INT CONF DATA ENG
AU Zhao, Yihong; Ramasamy, Karthikeyan; Tufte, Kristin; Naughton, Jeffrey F.
CS Univ of Wisconsin-Madison, Madison, WI, USA
SO (19980000) pp. 241-249. IEEE COMP SOC. LOS ALAMITOS, CA, (USA).
Meeting Info.: The 1998 14th International Conference on Data Engineering.
Orlando, FL, USA. 02/23-27/98.
DT Book
TC Conference
FS C
LA English
AB Since **multi-dimensional arrays** are a natural
data structure for supporting multi-dimensional queries, and
object-relational database systems support **multi-
dimensional array** ADTs, it is natural to ask if a
multi-dimensional array-based ADT can be used
to improve O/R DBMS performance on multi-dimensional queries. As an
initial step toward answering this question, we have implemented a
multi-dimensional array in the Paradise
Object-Relational DBMS. In this paper we describe the implementation of
this compressed-array ADT, and explore its performance for queries
including star-join consolidations and selections. We show that in many
cases the array ADT can provide significantly higher performance than can
be obtained by applying techniques such as **bitmap** indices and
star-join algorithms to relational **tables**.

L14 ANSWER 2 OF 2 COMPUSCIENCE COPYRIGHT 2004 FIZ KARLSRUHE on STN
AN 1996(6):AC31626 COMPUSCIENCE
TI Multi-table joins through bitmapped join indices.
AU O'Neil, Patrick; Graefe, Goetz
SO SIGMOD Rec. (Sep 1995) vol. 24(3), p. 8-11.
1995.
ISSN: 0163 5808
DT Journal

10/038,849

TC	Theoretical
LA	English
IP	ACM-GUIDE
DN	1995-03405

=>

10/038,849

FILE 'COMPUAB, COMPUSCIENCE, CONFSCI, CONF, ELCOM, INFODATA, RUSSCI,
SIGLE, RDISCLOSURE, ANTE, LISA' ENTERED AT 14:18:15 ON 01 DEC 2004

L1 1097 SEA BITMAP? OR (BIT OR STAR) (W) MAP? OR STARMAP? OR RASTER(1W)
IMAGE#
L2 40317 SEA ARRAY#
L3 1657 SEA L2(2N) (2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI) (1W) (D
OR DIMENSION?) OR CUBIC OR STEREOSCOP? OR STEREO(W) SCOP?)
L4 243 SEA L2(2N) (VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENS
ION?)
L5 43 SEA OUTERJOIN? OR OUTER(W) JOIN?
L6 71948 SEA INDEX? OR INDICIE? OR INDICE? OR SUBINDEX? OR SUBINDICE?
OR SUBINDICIE?
L7 2608 SEA HASH?
L8 115 SEA (NATURAL OR EQUI) (W) JOIN? OR NATURALJOIN? OR EQUIJOIN?
L9 193 SEA JOIN?(5N) (COLUMN? OR TABLE? OR ROW#)
L10 2972 SEA L1 OR (L3 OR L4)
L11 0 SEA L5 AND L10
L12 2 SEA (L8 OR L9) AND L10
L13 186575 SEA 2002-2004/PY
L14 2 SEA L12 NOT L13
L15 61 SEA RAMESH B?/AU
L16 61 SEA RAMESH, B?/AU
L17 1 SEA BHASHYAM R?/AU
L18 1 SEA BHASHYAM, R?/AU
L19 62 SEA (L15 OR L16 OR L17 OR L18)
L20 0 SEA L19 AND L10
L21 0 SEA L19 AND (L8 OR L9)
L22 0 SEA L19 AND L5

File 347:JAPIO Nov 1976-2004/Jul(Updated 041102)

(c) 2004 JPO & JAPIO

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200476

(c) 2004 Thomson Derwent

Set	Items	Description
S1	10305	BITMAP? OR (BIT OR STAR)() (MAP? ? OR MAPPED OR MAPPING?) OR STARMAP? OR RASTER(1W)IMAGE? ?
S2	212828	ARRAY? ?
S3	5048	S2(2N)(2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI)(1W)(D OR DIMENSION???? ?) OR CUBIC OR STEREO SCOP? OR STEREO() SCOP??-???? ?)
S4	348	S2(2N)(VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENSION?)
S5	63	OUTERJOIN? OR OUTER() (JOIN OR JOINS OR JOINED OR JOINING?)
S6	195836	INDEX? OR INDICIE? ? OR INDICE? ? OR SUBINDEX? OR SUBINDICIE? OR SUBINDICIE?
S7	4061	HASH?
S8	143	(NATURAL OR EQUI)() JOIN? OR NATURALJOIN? OR EQUIJOIN?
S9	8879	JOIN?(5N)(COLUMN? OR TABLE? OR ROW? ?)
S10	15640	S1 OR S3:S4
S11	0	S5 AND S10
S12	5	S8:S9 AND S10

12/9/2 (Item 1 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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014191868 **Image available**

WPI Acc No: 2002-012565/200202

XRPX Acc No: N02-010358

Star join operation method in relational database management system, involves selecting row and column from star map using hash row value and accessing fact table accordingly

Patent Assignee: NCR INT INC (NATC); NCR CORP (NATC)

Inventor: KOSTAMAA O P; RAMESH B; BHASHYAM R

Number of Countries: 027 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 1148430	A2	20011024	EP 2001303147	A	20010402	200202 B
US 6618729	B1	20030909	US 2000556009	A	20000420	200361

Priority Applications (No Type Date): US 2000556009 A 20000420

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

EP 1148430 A2 E 12 G06F-017/30

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT

LI LT LU LV MC MK NL PT RO SE SI TR

US 6618729 B1 G06F-017/00

Abstract (Basic): EP 1148430 A2

NOVELTY - A cross-product is generated from dimension tables referenced by star join , and join column are hashed to create a hash-row value. A portion of hash row value is used to select a star map row and its another portion is used to select column of selected row. A fact table is accessed to join with cross-product when selected column indicates that the record exist in fact table.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) Computer implemented system for performing star join;
(b) Data structure;
(c) Computer program for performing star join
USE - For performing star join operation in relational database management system (RDBMS) of computer system such as mainframe, micro computer or personal computer system.

ADVANTAGE - Since hash-row value is used for addressing **star map**, the size of map is maintained constant, thus improves the performance of star joins.

DESCRIPTION OF DRAWING(S) - The figure shows a hardware and software environment for performing star join.

pp; 12 DwgNo 1/5

Title Terms: STAR; JOIN; OPERATE; METHOD; RELATED; DATABASE; MANAGEMENT; SYSTEM; SELECT; ROW; COLUMN; STAR; MAP; HASH; ROW; VALUE; ACCESS; FACT; TABLE; ACCORD

Derwent Class: T01

International Patent Class (Main): G06F-017/00; G06F-017/30

File Segment: EPI

Manual Codes (EPI/S-X): T01-J05B4B; T01-J05B4M; T01-M06A; T01-M06B; T01-S03

12/9/3 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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013483314 **Image available**

WPI Acc No: 2000-655257/200063

XRPX Acc No: N00-485674

Computer system for identifying and constructing star joins in relational database system, determines snowflake which should appear in predetermined stage of query execution plan

Patent Assignee: INT BUSINESS MACHINES CORP (IBM)

Inventor: LINDSAY B G; SHEKITA E J; SIMMEN D E; TRUUVERT K

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6105020	A	20000815	US 99415799	A	19991011	200063 B

Priority Applications (No Type Date): US 99415799 A 19991011

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 6105020	A	13	G06F-017/30	

Abstract (Basic): US 6105020 A

NOVELTY - A logic is executed by a computer to respond to the query input through keyboard and mouse. A fact table and snow flakes of tables are determined from the tables of the query and cycles are eliminated from the tables of query. A minimal set of tables is determined from one snowflake and the snowflake which should appear in predetermined stage of query execution plan is determined.

DETAILED DESCRIPTION - One or more input devices such as keyboard and mouse, associated with computer, generates the query. A database includes tables that are accessible by the computer. INDEPENDENT CLAIMS are also included for the following:

(a) computer program device;

(b) computer implemented method for determining whether to execute first query execution plan in response to query

USE - For identifying and constructing star joins of data tables in relational database for **bit map** ANDing.

ADVANTAGE - The logic includes eliminating cycles among the tables and determining minimal set of tables is at least one snow flake which

should appear in bit map ANDing portion of query execution plan to respond to the query.

DESCRIPTION OF DRAWING(S) - The figure shows the flow chart illustrating a method for identifying and constructing star joins.

pp; 13 DwgNo 2/7

Title Terms: COMPUTER; SYSTEM; IDENTIFY; CONSTRUCTION; STAR; JOIN; RELATED; DATABASE; SYSTEM; DETERMINE; APPEAR; PREDETERMINED; STAGE; QUERY; EXECUTE ; PLAN

Derwent Class: T01

International Patent Class (Main): G06F-017/30

File Segment: EPI

Manual Codes (EPI/S-X): T01-E01A; T01-J05B3; T01-J05B4B; T01-J05B4M; T01-S03

?

File 348:EUROPEAN PATENTS 1978-2004/Nov W03

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File 349:PCT FULLTEXT 1979-2002/UB=20041125,UT=20041118

(c) 2004 WIPO/Univentio

Set	Items	Description
S1	12287	BITMAP? OR (BIT OR STAR)() (MAP? ? OR MAPPED OR MAPPING?) OR STARMAP? OR RASTER(1W)IMAGE? ?
S2	183543	ARRAY? ?
S3	14218	S2(2N)(2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI)(1W)(D OR DIMENSION???? ?) OR CUBIC OR STEREO SCOP? OR STEREO()SCOP??-???? ?)
S4	716	S2(2N)(VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENSION?)
S5	183	OUTERJOIN? OR OUTER() (JOIN OR JOINS OR JOINED OR JOINING?)
S6	229919	INDEX? OR INDICIE? ? OR INDICE? ? OR SUBINDEX? OR SUBINDICIE? OR SUBINDICIE?
S7	20546	HASH?
S8	26071	S1 OR S3:S4
S9	0	S5(25N)S8
S10	286	(NATURAL OR EQUI)()JOIN? OR NATURALJOIN? OR EQUIJOIN?
S11	1	S10(25N)S8
S12	5016	JOIN?(5N)(COLUMN? OR TABLE? OR ROW? ?)
S13	17	S12(25N)S8
S14	10	(S11 OR S13)(25N)S6:S7
S15	10	IDPAT (sorted in duplicate/non-duplicate order)
S16	10	IDPAT (primary/non-duplicate records only)

16/5,K/1 (Item 1 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

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01434955

Method of processing queries in a database system, and database system and software product for implementing such method

Methode zum Verarbeiten von Anfragen in einem Datenbanksystem, Datenbanksystem und Softwareprodukt zur Implementierung einer solchen Methode

Procede de traitement de demandes dans une base de donnees, base de donnees et produit logiciel pour mise en oeuvre de ce procede

PATENT ASSIGNEE:

Lafayette Software Inc., (3188060), Five Palo Alto Square, 3000 El Camino Real, Palo Alto, CA 94306-2155, (US), (Applicant designated States: all)

INVENTOR:

Koskas, Elie Ouzi, 9 Allee Eridan, 95350 Saint Brice sous Foret, (FR)

LEGAL REPRESENTATIVE:

Loisel, Bertrand (75211), Cabinet Plasseraud, 84, rue d'Amsterdam, 75440 Paris Cedex 09, (FR)

PATENT (CC, No, Kind, Date): EP 1217541 A1 020626 (Basic)

APPLICATION (CC, No, Date): EP 2000403332 001129;

DESIGNATED STATES: FR

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G06F-017/30

ABSTRACT EP 1217541 A1

A reference table, which may not be stored, has columns associated with data attributes and rows containing related words assigned to those attributes in a collection of data. The stored data include thesauruses associated with the attributes, and reference table row identifier lists respectively associated with thesaurus entries. Each thesaurus is defined

with reference to a partition into subsets of the words which can be assigned to the associated attribute, and has a respective entry for each subset including an assigned word, the row identifier list associated with this entry including any identifier allocated to a row of the reference table having a word of the subset assigned to the associated attribute. A matching reference table row identifier list is determined from the data representing the row identifier lists associated with thesaurus entries relevant to the query. To output a response, a thesaurus associated with at least one attribute is selected, and the entries of the selected thesaurus with which identifier lists having a non-empty intersection with the matching row identifier list are associated are detected.

ABSTRACT WORD COUNT: 177

NOTE:

Figure number on first page: NONE

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 020626 A1 Published application with search report

Withdrawal: 031105 A1 Date application deemed withdrawn: 20021228

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200226	1418
SPEC A	(English)	200226	34771
Total word count - document A			36189
Total word count - document B			0
Total word count - documents A + B			36189

...SPECIFICATION most of the database.

Five main approaches have been proposed to attack this problem: (i) **multidimensional arrays** ; (ii) **special indexes** ; (iii) **table caching**; (iv) **optimized foreign key joins** ; and (v) **approximation**.

(i) **Multidimensional arrays** (i.e. matrices).

This strategy consists of implementing the data warehouse as a **multidimensional array** or matrix. Examples may be found in U.S. Patents No. 5,359,724 and...

16/5,K/2 (Item 2 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

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01434954

Methods of organizing data and processing queries in a database system, and database system and software product for implementing such method

Methode zum Organisieren von Daten und zum Verarbeiten von Anfragen in einem Datenbanksystem, Datenbanksystem und Softwareprodukt zur Implementierung solcher Methode

Procede d'organisation de donnees et de traitement de demandes, base de donnees et produit logiciel pour mise en oeuvre de ce procede

PATENT ASSIGNEE:

Lafayette Software Inc., (3188060), Five Palo Alto Square, 3000 El Camino Real, Palo Alto, CA 94306-2155, (US), (Applicant designated States: all)

INVENTOR:

Koskas, Elie Ouzi, 9, Allee Eridan, 95350 Saint Brice sous Foret, (FR)

LEGAL REPRESENTATIVE:

Loisel, Bertrand (75211), Cabinet Plasseraud, 84, rue d'Amsterdam, 75440 Paris Cedex 09, (FR)

PATENT (CC, No, Kind, Date): EP 1217540 A1 020626 (Basic)
APPLICATION (CC, No, Date): EP 2000403331 001129;
DESIGNATED STATES: FR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: G06F-017/30

ABSTRACT EP 1217540 A1

A reference table has columns associated with data attributes and rows containing related words assigned to those attributes in a collection of data, those words coming from different data tables having independent numbers of records. The stored data include word thesauruses associated with the attributes, and reference table row identifier lists respectively associated with thesaurus entries. Each word thesaurus associated with an attribute has a respective entry for each word assigned to this data attribute in the collection of data. The reference table, which may be a virtual table, defines a unified algebraic framework for the entries of all the thesauruses. Query criteria can be examined with reference to the relevant thesauruses to obtain a row-ID list or bitmap vector which represents all the reference table rows matching the query criteria, if any. The results can then be delivered through the original data tables or, preferably, by means of the thesauruses.

ABSTRACT WORD COUNT: 152

NOTE:

Figure number on first page: NONE

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 020626 A1 Published application with search report

Withdrawal: 031105 A1 Date application deemed withdrawn: 20021228

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200226	2066
SPEC A	(English)	200226	41057
Total word count - document A			43123
Total word count - document B			0
Total word count - documents A + B			43123

...SPECIFICATION most of the database.

Five main approaches have been proposed to attack this problem: (i) **multidimensional arrays** ; (ii) special **indexes** ; (iii) **table** caching; (iv) optimized foreign key **joins** ; and (v) approximation.

(i) **Multidimensional arrays** (i.e. matrices).

This strategy consists of implementing the data warehouse as a **multidimensional array** or matrix. Examples may be found in U.S. Patents No. 5,359,724 and...

16/5,K/3 (Item 3 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

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01431994

Methods of organising data and processing queries in a database system

Methode zum Organisieren von Daten und zum Bearbeiten von Anfragen in einem Datenbanksystem

Methode pour l'organisation de donnees et pour le traitement de demandes dans un systeme de base de donnees

PATENT ASSIGNEE:

Lafayette Software Inc., (3188060), Five Palo Alto Square, 3000 El Camino

Real, Palo Alto, CA 94306-2155, (US), (Applicant designated States: all)

INVENTOR:

Koskas, Elie Ouzi, 9, Allee Eridan, 95350 Saint Brice sous Foret, (FR)

LEGAL REPRESENTATIVE:

Loisel, Bertrand (75211), Cabinet Plasseraud, 84, rue d'Amsterdam, 75440 Paris Cedex 09, (FR)

PATENT (CC, No, Kind, Date): EP 1211610 A1 020605 (Basic)

APPLICATION (CC, No, Date): EP 2000403329 001129;

DESIGNATED STATES: FR

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G06F-017/30

ABSTRACT EP 1211610 A1

A reference table, which may not be stored, has columns associated with data attributes and rows containing related words assigned to those attributes in a collection of data. The stored data include at least one macroword thesaurus associated with an attribute and with a prefix length shorter than a word length of said attribute, and reference table row identifier lists respectively associated with thesaurus entries. Each macroword thesaurus associated with an attribute and with a prefix length has a respective entry for each prefix value having this prefix length and matching a corresponding prefix of at least one word assigned to this data attribute in the collection of data.

ABSTRACT WORD COUNT: 110

NOTE:

Figure number on first page: 19

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 020605 A1 Published application with search report

Withdrawal: 030903 A1 Date application deemed withdrawn: 20021206

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200223	2116
SPEC A	(English)	200223	39600
Total word count - document A			41716
Total word count - document B			0
Total word count - documents A + B			41716

...SPECIFICATION most of the database.

Five main approaches have been proposed to attack this problem: (i) **multidimensional arrays** ; (ii) **special indexes** ; (iii) **table caching**; (iv) **optimized foreign key joins** ; and (v) **approximation**.

(i) **Multidimensional arrays** (i.e. matrices).

This strategy consists of implementing the data warehouse as a **multidimensional array** or matrix. Examples may be found in U.S. Patents No. 5,359,724 and...

16/5,K/4 (Item 4 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

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01344122

Optimization of a star join operation using a bitmap index structure

Optimisierung einer Stern-Verbindungs-Operation unter Benutzung einer Bitmap-Index-Struktur

Optimisation d'une operation de raccordement en etoile en utilisant une structure d'indexes en mode point

PATENT ASSIGNEE:

NCR International, Inc., (1449484), 1700 South Patterson Boulevard,
Dayton, Ohio 45479, (US), (Applicant designated States: all)

INVENTOR:

Ramesh, Bhashyam, 7560 Charmant Drive, Apt. 1531, San Diego, CA 92122,
(US)

Kostamaa, Olli Pekka, 807, 21st Street, No. 6, Santa Monica, CA 90403,
(US)

LEGAL REPRESENTATIVE:

Williamson, Brian et al (84716), Barker Bretell 10-12 Priests Bridge,
London SW15 5JE, (GB)

PATENT (CC, No, Kind, Date): EP 1148430 A2 011024 (Basic)
EP 1148430 A3 030129

APPLICATION (CC, No, Date): EP 2001303147 010402;

PRIORITY (CC, No, Date): US 556009 000420

DESIGNATED STATES: DE; FR; GB

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G06F-017/30

ABSTRACT EP 1148430 A2

The invention relates to the optimization of a star join operation in relational database management systems (RDBMS). A cross-product is generated from a plurality of dimension **tables** referenced by the star join. The join columns of the cross-product are then hashed to create a hash-row value. Using the hash-row value, a Star Map is probed to determine whether a record exists in a fact table that corresponds to the cross-product, wherein a first portion of the hash-row value is used to select a row of the Star Map and a second portion of the hash-row value is used to select a column of the selected row of the Star Map. The fact table is accessed to perform a merge join with the cross-product when the selected column of the selected row of the Star Map indicates that the record exists in the fact table.

ABSTRACT WORD COUNT: 145

NOTE:

Figure number on first page: NONE

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 011024 A2 Published application without search report
Search Report: 030129 A3 Separate publication of the search report
Examination: 030924 A2 Date of request for examination: 20030729
Examination: 040211 A2 Date of dispatch of the first examination
report: 20040102

Change: 040825 A2 Legal representative(s) changed 20040706

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200143	1140
SPEC A	(English)	200143	4752
Total word count - document A			5892
Total word count - document B			0
Total word count - documents A + B			5892

...ABSTRACT relational database management systems (RDBMS). A cross-product is generated from a plurality of dimension **tables** referenced by the star join. The join columns of the cross-product are then hashed to create a hash-row value. Using the hash-row value, a Star Map is probed to determine whether a record exists in a fact table that corresponds to the cross-product, wherein a first portion of the hash-row value is used to select a row of the Star Map and a second...

...SPECIFICATION to the computer, the method comprising generating a

2. The method of claim 1, wherein the Star Map comprises a bitmap index structure that is used to filter accesses to the fact table.
 3. The method of...
- ...exist in the fact table.
6. The method of claim 5, further comprising performing another hash function on the join columns of the cross-product to select one or more of a plurality of bits in the multiple bit value stored in the column of the Star Map, in order to deal with collisions from the hashing step.
 7. The method of claim 6, wherein each of the plurality of bits in...
- ...product from one or more dimension tables referenced by the star join;
- (b) means for hashing one or more join columns of the cross-product to create a hash-row value;
 - (c) means for using the hash-row value to probe a Star Map to determine whether a record exists in the fact table that corresponds to the cross-product, wherein a first portion of the hash-row value is used to select a row of the Star Map and a second portion of the hash-row value is used to select a column of the selected row of the Star Map; and
 - (d) means for accessing the fact table to perform a join with the cross-product when the selected column of the selected row of the Star Map indicates that the record may exist in the fact table.
13. The system of claim 12, wherein the Star Map comprises a bitmap index structure that is used to filter accesses to the fact table.
 14. The system of...
- ...the fact table.
17. The system of claim 16, further comprising means for performing another hash function on the join columns of the cross-product to select one or more of a plurality of bits in the multiple bit value stored in the column of the Star Map, in order to deal with collisions from the means for hashing.
 18. The system of claim 17, wherein each of the plurality of bits in the ...for filtering accesses to one or more fact tables referenced in a query, wherein the Star Map is probed using a hash-row value created from one or more join columns of a cross-product generated from one or more dimension tables referenced by the star join to determine whether a record exists in the fact table that corresponds to the cross-product, wherein a first portion of the hash-row value is used to select a row of the Star Map and a second portion of the hash-row value is used to select a column of the selected row of the Star Map.
 24. The data structure of claim 23 wherein the fact table is accessed to perform a join with the cross-product when the selected column of the selected row of the Star Map indicates that the record may exist in the fact table.
 25. A computer program comprising...

16/5,K/5 (Item 5 from file: 348)
 DIALOG(R)File 348:EUROPEAN PATENTS
 (c) 2004 European Patent Office. All rts. reserv.

00966565

Method and apparatus for performing a join query in a database system
 Verfahren und Einrichtung zum Ausführen einer Verbindungsabfrage in einem
 Datenbanksystem

Methode et dispositif por realiser des requetes de jointures dans un syseme de bases de donnees

PATENT ASSIGNEE:

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INVENTOR:

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LEGAL REPRESENTATIVE:

Burt, Roger James, Dr. et al (52154), IBM United Kingdom Limited
Intellectual Property Law Hursley Park, Winchester Hampshire SO21 2JN, (GB)

PATENT (CC, No, Kind, Date): EP 877327 A2 981111 (Basic)
EP 877327 A3 000906

APPLICATION (CC, No, Date): EP 98302804 980407;

PRIORITY (CC, No, Date): US 833519 970407

DESIGNATED STATES: BE; CH; DE; ES; FR; GB; IE; IT; LI; NL; SE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G06F-017/30

ABSTRACT EP 877327 A2

A computer implemented method for generating a response to a join. Two tables are divided into fragments. A join fragment map identifies, for each respective fragment from the first table, the fragments from the second table which contain a record that satisfies the join predicate with a record from the respective fragment from the first table. The map is used to eliminate fragments which cannot satisfy the join predicate.

ABSTRACT WORD COUNT: 70

NOTE:

Figure number on first page: 1

LEGAL STATUS (Type, Pub Date, Kind, Text):

Search Report: 000906 A3 Separate publication of the search report
Application: 981111 A2 Published application (Alwith Search Report
;A2without Search Report)
Change: 020327 A2 Legal representative(s) changed 20020206
Assignee: 020327 A2 Transfer of rights to new applicant:
International Business Machines Corporation
(200128) New Orchard Road Armonk, NY 10504 US
Change: 020123 A2 Legal representative(s) changed 20011130
Examination: 981111 A2 Date of filing of request for examination:
980420

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9846	1121
SPEC A	(English)	9846	6177
Total word count - document A			7298
Total word count - document B			0
Total word count - documents A + B			7298

...SPECIFICATION data definition language for a given database in similar fashion to the creation of an **index** . The database system can implicitly create a **bitmap** when a foreign key relationship is specified as an

integrity constraint. The system can exhaustively search for joins between tables that yield sparse bitmaps.

In all of these cases, the system can use sampling to verify the expected sparseness of a resulting bitmap. The sparseness is the percentage of bits that are turned on in a bitmap indicating...

16/5,K/6 (Item 6 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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01131491 **Image available**
INDEXING, REWRITING AND EFFICIENT QUERYING OF RELATIONS REFERENCING SEMISTRUCTURED DATA
INDEXATION, REECRITURE ET INTERROGATION EFFICACE DE RELATIONS FAISANT REFERENCE A DES DONNEES SEMI-STRUCTUREES

Patent Applicant/Assignee:

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Inventor(s):

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Legal Representative:

WAKIMURA Mary Lou (et al) (agent), Hamilton, Brook, Smith & Reynolds, P.C., 530 Virginia Road Box 9133, Concord, MA 01742-9133, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200453633 A2 20040624 (WO 0453633)

Application: WO 2003US35818 20031112 (PCT/WO US03035818)

Priority Application: US 2002316986 20021210

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM
DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC
LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH PL PT RO RU
SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE
SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 14604

English Abstract

The invention discloses methods and apparatus that facilitate efficient querying of tables referencing semistructured data such as digraphs and other domains with complex grouping structure. The invention methods enable meaningful indexing of the tables as well as rewriting of queries with respect to the structures. Dynamic schema extraction using proper coloring algorithms is disclosed that structures the semistructured data in such a way that complex set operations and grouping are replaced with traditional relational joints. This enables a relational database system to harness its entire query optimizing capability when querying tables referencing semistructured data.

French Abstract

La presente invention concerne des procedes et des dispositifs qui facilitent l'interrogation efficace de tables dans lesquelles sont referencees des donnees semi-structurees telles que des digrammes et autres domaines a structure de groupement complexe. Les procedes de l'invention permettent une indexation convenable des tables ainsi qu'une reecriture d'interrogations convenable vis-a-vis des structures. L'invention a egalement pour objet une extraction de schema dynamique faisant intervenir des algorithmes de coloration propres qui sert a structurer les donnees semi-structurees de sorte que des operations d'ensembles complexes et l'operation de groupement sont remplacees par des liens relationnels traditionnels. Cela permet a un systeme de base de donnees relationnelle d'exploiter la totalite de ses capacites d'optimisation de recherche lors de l'interrogation de tables dans lesquelles sont referencees des donnees semi-structurees.

Legal Status (Type, Date, Text)

Publication 20040624 A2 Without international search report and to be republished upon receipt of that report.

Fulltext Availability:

Detailed Description

Detailed Description

... from the semistructured data, the Clique and Color relation as well as to establish additional **indexing** both on the **tables** individually and by using the **join** condition between the **table column** (s) and the **Clique table** . This may include **bitmap join indexes** . One of the current implementations of the system in an Oracle database, for example, creates 36 **bitniap join indexes** (since there are 3 6 colors required for proper coloring of **Int(Ge)** in this...

...on the Accidents and Clique(F) relations. In particular, for a large Accidents table, **bitiriap indexes** on the Accidents **table** or **bitmap join indexes** on the **joined tables** can be used.

5 3. Cyclic Digraphs: The algorithms disclosed for digraphs are written so...colors represented by columns C1, C2, C3, C4 and C5 in table **Clique(Ge)**. The **index** create statement also adds **bitmap j oin indexes** oil the color columns based on the **equijoin** between the node columns of **Clique(F)** and the Measurements table. This may be done using the **bitinap j oin index** create statement of the relational database system. Queries using the **Ge** operator are then made...

16/5,K/7 (Item 7 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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01100561 **Image available**

INDEXED DATA STORAGE SYSTEM, METHOD AND DATA STRUCTURE

SYSTEME DE MEMORISATION DE DONNEES INDEXE, PROCEDE CORRESPONDANT ET STRUCTURE DE DONNEES

Patent Applicant/Assignee:

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Patent Applicant/Inventor:

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(Designated only for: US)

Legal Representative:

STEX TECHNOLOGIES LIMITED (agent), 7 Bondel Road, Kolkata 700 019, IN,
Patent and Priority Information (Country, Number, Date):

Patent: WO 200423328 A1 20040318 (WO 0423328)

Application: WO 2003IN297 20030905 (PCT/WO IN03000297)

Priority Application: IN 2002524 20020905

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG
SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE
SI SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-017/00

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 14971

English Abstract

An indexed data structure and associated method and system are disclosed. Data records to be stored are reduced to a single dimension and then stored and indexed using a plurality of inter-related data stores (100). The data stores (100) store both data and metadata within generic records. In a preferred embodiment, the data stores (100) comprise 4 B+ Trees. A method for storing data, inserting data into an existing data structure, deleting data records and searching the data structure is disclosed, as is a computer system for use with the data structure.

French Abstract

L'invention concerne une structure de donnees indexee, ainsi qu'un procede et un systeme correspondants. Des enregistrements de donnees a memoriser sont reduits a une dimension unique, puis memorises et indexes au moyen d'une pluralite de memoires de donnees (100) en correlation entre elles. Les memoires de donnees (100) stockent des donnees et des metadonnees dans des enregistrements generiques. Selon une forme d'execution preferee, les memoires de donnees (100) comprennent 4B+ structures arborescentes. L'invention concerne en outre un procede de memorisation de donnees, d'insertion de donnees dans une structure de donnees existante, de suppression d'enregistrements de donnees et de recherche de structure de donnees, ainsi qu'un systeme d'ordinateur utilisable avec ladite structure de donnees.

Legal Status (Type, Date, Text)

Publication 20040318 A1 With international search report.

Publication 20040318 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Fulltext Availability:

Detailed Description

Detailed Description

... Assume that the condition contains a total of d attributes.

We will use the multi-table joins as suggested in Multi-table Joins Through Bitmapped Join Indices, ACM SIGMOD Records, September 1995 by P. O'Neil and Goetz Graefe. We assume that...

16/5,K/8 (Item 8 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00986561 **Image available**
USING ASSOCIATIVE MEMORY TO PERFORM DATABASE OPERATIONS
UTILISATION D'UNE MEMOIRE ASSOCIATIVE POUR EXECUTER DES OPERATIONS DE BASE DE DONNEES

Patent Applicant/Assignee:

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Patent Applicant/Inventor:

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YIP Kenneth, 4030 75th Street, Apt. 7G, Elmhurst, NY 11373, US, US (Residence), US (Nationality), (Designated only for: US)

Legal Representative:

G E EHRLICH (1995) LTD (agent), 28 Bezalel Street, 52 521 Ramat Gan, IL,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200317136 A1 20030227 (WO 0317136)

Application: WO 2002IL677 20020815 (PCT/WO IL0200677)

Priority Application: US 2001312778 20010816

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT (utility model) AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ (utility model) CZ DE (utility model) DE DK (utility model) DK DM DZ EC EE (utility model) EE ES FI (utility model) FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK (utility model) SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-017/30

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 11058

English Abstract

A system and method for employing associative memory for the storing the data of a relational database. The system and method of the present invention optionally include additional hardware components in order for the associative memory to be usable for the relational database, as CAM (content associated memory) (106).

French Abstract

L'invention concerne un systeme et un procede destines a utiliser une memoire associative pour stocker des donnees d'une base de donnees relationnelle. Ce systeme et ce procede comprennent eventuellement des composants materiels supplementaires permettant a la memoire associative (CAM) (106), notamment une memoire auto-associative, d'etre utilisee dans une base de donnees relationnelle.

Legal Status (Type, Date, Text)

Publication 20030227 A1 With international search report.

Publication 20030227 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Fulltext Availability:

Detailed Description

Detailed Description

... in a value range from 0 to 1) of the oin predicate.

Star queries which join a fact table to multiple dimension tables can use bitmap indexes .

To choose an execution plan for a join statement, the query optimizer must make a...

16/5,K/9 (Item 9 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00910808 **Image available**

METHODS OF ORGANIZING DATA AND PROCESSING QUERIES IN A DATABASE SYSTEM, AND DATABASE SYSTEM AND SOFTWARE PRODUCT FOR IMPLEMENTING SUCH METHODS
PROCEDES D'ORGANISATION DE DONNEES ET DE DEMANDES DE TRAITEMENT DANS UN SYSTEME DE BASE DE DONNEES, ET SYSTEME DE BASE DE DONNEES ET PROGICIEL POUR LA MISE EN OEUVRE DE CES PROCEDES

Patent Applicant/Assignee:

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Inventor(s):

KOSKAS Elie Ouzi, 9, Allee Eridan, F-95350 Saint Brice Sous Foret, FR,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200244943 A2 20020606 (WO 0244943)

Application: WO 2001IB2792 20011129 (PCT/WO IB01002792)

Priority Application: EP 2000403329 20001129; EP 2000403330 20001129; EP 2000403331 20001129; EP 2000403332 20001129

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI
SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZM ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-017/30

Publication Language: English

Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 59996

English Abstract

French Abstract

Legal Status (Type, Date, Text)

Publication 20020606 A2 Without international search report and to be
republished upon receipt of that report.

Examination 20021121 Request for preliminary examination prior to end of
19th month from priority date

Declaration 20040401 Late publication under Article 17.2a

Republication 20040401 A2 With declaration under Article 17(2)(a); without
abstract; title not checked by the International
Searching Authority.

Fulltext Availability:
Detailed Description

Detailed Description
... most of the database.

Five main approaches have been proposed to attack this problem: (i)
multidimensional arrays ; (ii) special **indexes** ; (iii) **table**
caching; (iv) optimized foreign key **joins** ; and (v) approximation.

(i) **Multidimensional arrays** (ie. matrices).

This strategy consists of implementing the data warehouse as a
multidimensional array or matrix. Examples may be found in U.S.
Patents No.

5,359,724 and...

?

File 347:JAPIO Nov 1976-2004/Jul(Updated 041102)
 (c) 2004 JPO & JAPIO
 File 350:Derwent WPIX 1963-2004/UD,UM &UP=200476
 (c) 2004 Thomson Derwent
 File 348:EUROPEAN PATENTS 1978-2004/Nov W03
 (c) 2004 European Patent Office
 File 349:PCT FULLTEXT 1979-2002/UB=20041125,UT=20041118
 (c) 2004 WIPO/Univentio

Set	Items	Description
S1	18	AU=RAMESH B?
S2	1	AU=BHASHYAM R?
S3	18	S1:S2
S4	22592	BITMAP? OR (BIT OR STAR) () (MAP? ? OR MAPPED OR MAPPING?) OR STARMAP? OR RASTER(1W)IMAGE? ?
S5	724823	2D OR 3D OR (2 OR 3 OR TWO OR THREE OR MULTI) (1W) (D OR DIMENSION???? ?) OR CUBIC OR STEREOSCOP? OR STEREO() SCOP?????? ?
S6	19993	ARRAY? ?(2N) (S5 OR VOLUMETRIC OR HOLOGRAPH? OR HOLOGRAM? OR MULTIDIMENSION?)
S7	2	S3 AND (S4 OR S6)

7/9/1 (Item 1 from file: 350)
 DIALOG(R)File 350:Derwent WPIX
 (c) 2004 Thomson Derwent. All rts. reserv.

014191868 **Image available**
 WPI Acc No: 2002-012565/200202
 XRPX Acc No: N02-010358

Star join operation method in relational database management system, involves selecting row and column from star map using hash row value and accessing fact table accordingly

Patent Assignee: NCR INT INC (NATC); NCR CORP (NATC)

Inventor: KOSTAMAA O P; RAMESH B ; BHASHYAM R

Number of Countries: 027 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 1148430	A2	20011024	EP 2001303147	A	20010402	200202 B
US 6618729	B1	20030909	US 2000556009	A	20000420	200361

Priority Applications (No Type Date): US 2000556009 A 20000420

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
EP 1148430	A2	E 12	G06F-017/30	

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT
 LI LT LU LV MC MK NL PT RO SE SI TR

US 6618729 B1 G06F-017/00

Abstract (Basic): EP 1148430 A2

NOVELTY - A cross-product is generated from dimension tables referenced by star join, and join column are hashed to create a hash-row value. A portion of hash row value is used to select a star map row and its another portion is used to select column of selected row. A fact table is accessed to join with cross-product when selected column indicates that the record exist in fact table.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

- (a) Computer implemented system for performing star join;
- (b) Data structure;
- (c) Computer program for performing star join

USE - For performing star join operation in relational database management system (RDBMS) of computer system such as mainframe, micro

computer or personal computer system.

ADVANTAGE - Since hash-row value is used for addressing **star map**, the size of map is maintained constant, thus improves the performance of star joins.

DESCRIPTION OF DRAWING(S) - The figure shows a hardware and software environment for performing star join.

pp; 12 DwgNo 1/5

Title Terms: STAR; JOIN; OPERATE; METHOD; RELATED; DATABASE; MANAGEMENT; SYSTEM; SELECT; ROW; COLUMN; STAR; MAP; HASH; ROW; VALUE; ACCESS; FACT; TABLE; ACCORD

Derwent Class: T01

International Patent Class (Main): G06F-017/00; G06F-017/30

File Segment: EPI

Manual Codes (EPI/S-X): T01-J05B4B; T01-J05B4M; T01-M06A; T01-M06B; T01-S03

7/5/2 (Item 1 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

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01344122

Optimization of a star join operation using a bitmap index structure
Optimisierung einer Stern-Verbindungs-Operation unter Benutzung einer
Bitmap -Index-Struktur

Optimisation d'une operation de raccordement en etoile en utilisant une
structure d'indexes en mode point

PATENT ASSIGNEE:

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INVENTOR:

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(US)

Kostamaa, Olli Pekka, 807, 21st Street, No. 6, Santa Monica, CA 90403,
(US)

LEGAL REPRESENTATIVE:

Williamson, Brian et al (84716), Barker Bretell 10-12 Priests Bridge,
London SW15 5JE, (GB)

PATENT (CC, No, Kind, Date): EP 1148430 A2 011024 (Basic)
EP 1148430 A3 030129

APPLICATION (CC, No, Date): EP 2001303147 010402;

PRIORITY (CC, No, Date): US 556009 000420

DESIGNATED STATES: DE; FR; GB

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G06F-017/30

ABSTRACT EP 1148430 A2

The invention relates to the optimization of a star join operation in relational database management systems (RDBMS). A cross-product is generated from a plurality of dimension tables referenced by the star join. The join columns of the cross-product are then hashed to create a hash-row value. Using the hash-row value, a **Star Map** is probed to determine whether a record exists in a fact table that corresponds to the cross-product, wherein a first portion of the hash-row value is used to select a row of the **Star Map** and a second portion of the hash-row value is used to select a column of the selected row of the **Star Map**. The fact table is accessed to perform a merge join with the cross-product when the selected column of the selected row of the **Star Map** indicates that the record exists in the fact table.

ABSTRACT WORD COUNT: 145

NOTE:

Figure number on first page: NONE

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 011024 A2 Published application without search report
Search Report: 030129 A3 Separate publication of the search report
Examination: 030924 A2 Date of request for examination: 20030729
Examination: 040211 A2 Date of dispatch of the first examination
report: 20040102

Change: 040825 A2 Legal representative(s) changed 20040706

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200143	1140
SPEC A	(English)	200143	4752
Total word count - document A			5892
Total word count - document B			0
Total word count - documents A + B			5892
?			